AMENDMENTS TO THE CLAIMS

Pursuant to 37 C.F.R. § 1.121 the following listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) A method for representation~~, interpolation~~ and/or compression of data, the method comprising the steps of:

identifying a two-dimensional interpolation function s(z) based on a sampling function a(z), wherein a Cauchy integral theorem ~~being~~ is applicable for the interpolation function s(z); and

using the interpolation function s(z) for at least one of representation~~, interpolation~~ and compression of the data.

2. (Original) The method as recited in claim 1, wherein a residue theorem is applicable for the interpolation function s(z).

3. (Currently Amended) The method as recited in claim 1 wherein the sampling function a(z) is a function over the complex numbers for which a(0)=1 and at ~~at~~ least all other sampled values z_j to be considered is equal to zero.

4. (Original) The method as recited in claim 3 wherein the interpolation function s(z) can be represented by

$$s(z) = \sum s_j a(z - z_j)$$

wherein s(z) is capable of being represented by the function values s_j at the complex sampling points z_j.

5. (Original) The method as recited in claim 1 wherein the sampling function a(z) is constructed using at least one of a double-periodic and a quasi-double periodic complex function.

6. (Original) The method as recited in claim 1 wherein the sampling function a(z) is a complex holomorphic function.

7. (Original) The method as recited in claim 6 wherein the sampling function a(z) is a complex holomorphic function except at existing poles.

8. (Original) The method as recited in claim 1 wherein sampled values of the interpolation function s(z) are located within a closed curve C.

9. (Original) The method as recited in claim 1 wherein function values of the interpolation function s(z) for points on a curve C are determined by an equation $s(z) = \sum s_j a(z - z_j)$.

10. (Original) The method as recited in claim 9 wherein the curve C is a closed curve and wherein function values on the curve C are parameterized using a path length so as to obtain an equivalent one-dimensional data set.

11. (Original) The method as recited in claim 10 wherein points of interpolation function s(z) within the curve C are determined by function values on the curve C using the Cauchy integral theorem and, if poles are present, using the residue theorem.

12. (Original) The method as recited in claim 1 wherein the sampling function a(z) satisfies $a(z) = sl(\overline{\pi z})/(\overline{\pi z})$.

13. (Original) The method as recited in claim 12 wherein sl(z) is a Sinus Lemniscatus, the Sinus Lemniscatus being an elliptic function which can be represented using Jacobian elliptic functions.

14. (Original) The method as recited in claim 1 wherein the using the interpolation function for the compression of the data is performed by mapping the data is mapped onto points within a curve C

and representing the data by points on a closed boundary curve, the representing being performed using the interpolation function s(z).

15. (Original) The method as recited in claim 14 wherein the mapping the data onto points within the curve C is performed on a line-by-line basis.

16. (Original) The method as recited in claim 2 wherein the using the interpolation function for the compression of the data is performed by mapping the data is mapped onto points within a curve C and representing the data by points on a closed boundary curve, the representing being performed using the interpolation function s(z).

17. (Original) The method as recited in claim 1 wherein the data is automatically processable.

18. (Currently Amended) A computer readable medium having stored thereon computer executable process steps operative to perform a method for representation~~, interpolation~~ and/or compression of data, the method comprising <u>the steps of</u>:

identifying a two-dimensional interpolation function s(z) based on a sampling function a(z), <u>wherein</u> a Cauchy integral theorem ~~being~~ <u>is</u> applicable for the interpolation function s(z); <u>and</u>

using the interpolation function s(z) for at least one of representation~~, interpolation~~ and compression of the data.

19. (Currently Amended) A computer system comprising a processor configured to execute computer executable process steps operative to perform a method for representation~~, interpolation~~ and/or compression of data, the method comprising:

identifying a two-dimensional interpolation function s(z) based on a sampling function a(z), <u>wherein</u> a Cauchy integral theorem ~~being~~ <u>is</u> applicable for the interpolation function s(z); <u>and</u>

using the interpolation function s(z) for at least one of representation~~, interpolation~~ and compression of the data.

20. (New) The method as recited in claim 3, further comprising the step of:

calculating values of the two-dimensional interpolation function s(z) within a closed curve C using values of the two-dimensional interpolation function s(z) located on a boundary of an area bounded by C so as to perform a low-pass filtering of the data.